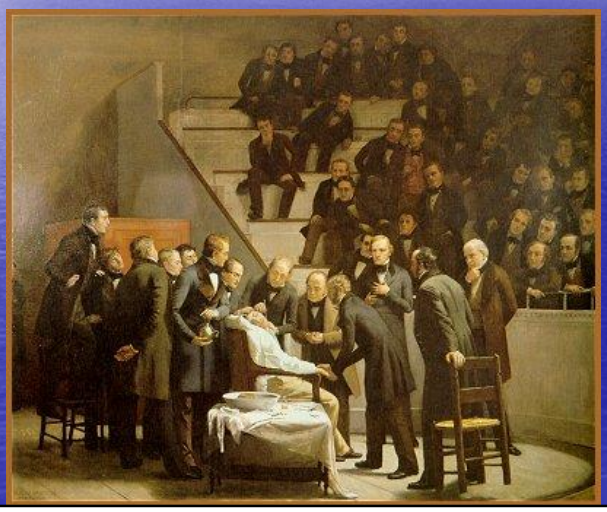
Basics of Anesthesia



Lecture Objectives

- Discuss briefly the History of Anesthesia
- Discuss the scope of anesthesia including preoperative assessment, intraoperative care and postoperative care.

The History of Anesthesia

- The first successful anesthetic took place at Massachusetts General Hospital in 1846 by a dentist, Dr. William T Morton.
- No significant new inhaled anesthetics were introduced during the next 80 years.
- Cyclopropane, because of its low blood solubility and support of the circulation, became the most important new inhaled anesthetic in the 1930's.
- Fluorinated inhaled anesthetics were used in the 1950's because of minimal depression of cardiovascular function, less organ toxicity and low blood solubility.
- Presently, one gas (nitrous oxide) and the vapors of three volatile liquids (sevoflurane, desflurane & isoflurane) represent the commonly used inhaled anesthetics.

Preoperative management

- Areas to investigate in preop history.
- Previous adverse responses related to anesthesia
  - Allergic Reactions
  - Sleep apnea
  - Prolonged skeletal muscle paralysis
  - Delayed awakening
  - Nausea and vomiting
  - Adverse responses in relatives
- Central Nervous System
  - Cerebrovascular insufficiency
  - Seizures
- Cardiovascular System
  - Exercise Tolerance
  - Angina
  - Prior MI
  - HTN
  - Claudication

- Lungs
  - Exercise Tolerance
  - Dyspnea and Orthopnea
  - Cough and Sputum Production
  - Cigarette consumption
  - Pneumonia
  - Recent upper resp. tract infection
- Liver
  - Alcohol Consumption
  - Hepatitis
- Kidneys
  - Nocturia
  - Pyuria
- Skeletal and Muscular Systems
  - Arthritis
  - Osteoporosis
  - Weakness

- Endocrine System
  - Diabetes mellitus
  - Thyroid gland dysfunction
  - Adrenal gland dysfunction
- Coagulation
  - Bleeding tendency
  - Easy bruising
  - Hereditary coagulopathies
- Reproductive System
  - Menstrual History
  - STD's
- Dentition
  - Dentures
  - Caps

- Other important Info needed in History:
- Current Drug Therapy
- Neonatal Hx
- Previous Surgeries

- Physical Exam:

- CNS
- Level of Consciousness
- Evidence of peripheral, sensory or skeletal muscle dysfxn

- CV
- Auscultation of heart
- Systemic blood pressure
- Peripheral pulses
- Veins
- Peripheral edema

- Lungs
- Auscultation of Lungs
- Pattern of breathing

- Upper Airway
- Cervical spine mobility
- Temporomandibular mobility
- Tracheal mobility
- Prominent central incisors
- Diseased or artificial teeth
- Ability to visualize uvula
- Thyromental distance

Mallampati Classification

- Size of Tongue Versus Pharynx

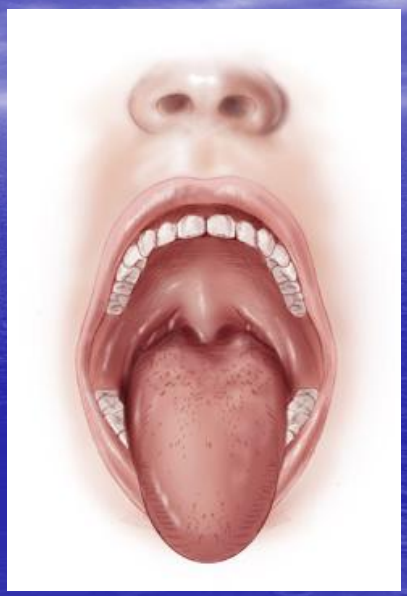
- The size of the tongue versus the oral cavity can be visually graded by assessing how much the pharynx is obscured by the tongue. This is the basis for the Mallampati Classification.

Class I

- Soft palate,anterior and posterior tonsillar pillars and uvula visible

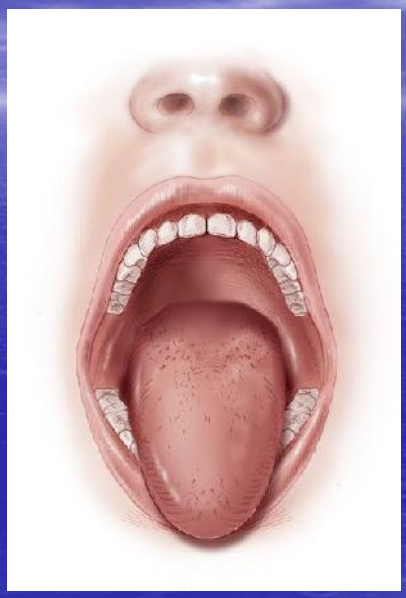
Class I I

- Tonsillar pillars and base of uvula hidden by base of tongue



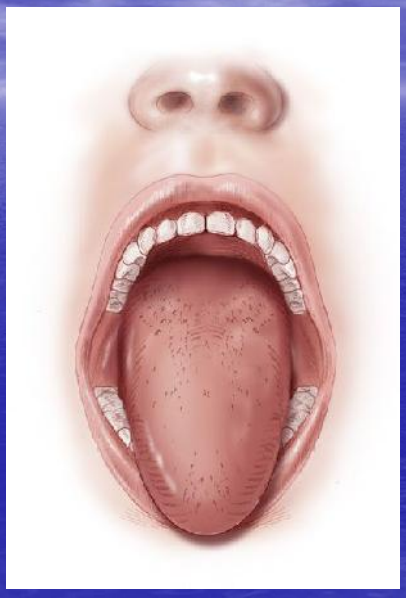
Class III

- Only soft palate visible



Class IV

- Soft palate not visible



- What Laboratory tests are needed?
- Surgical patients require preop lab and diagnostic studies that are consistent with their medical histories, the proposed operative procedures, and the potential for blood loss.

Lab Test	Clinical indications
• CXR	• Pneumonia, pulmonary edema, • Atelectasis,mediastinal or pulmonary masses,pulm. HTN,cardiomegaly, Advanced COPD with blebs, PE
• ECG	• Hx of CAD,Age > 50, HTN, chest pain, CHF, diabetes, PVD, SOB, DOE,palpitations, murmurs

Lab test	Clinical Indications
LFT	Hx of Hepatitis, Cirrhosis, portal HTN, GB or biliary tract disease, Jaundice
Renal fxn testing	HTN, increased fluid overload, diabetes, urinary problems, dialysis pt's

Lab Test	Clinical Indications
CBC	Hematologic disorder, bleeding, malignancy, Chemo/radiation tx, renal ds., highly invasive or trauma sx.
Coagulation testing	Bleeding disorder hx., Anticoagulant meds, Hepatic ds.
Pregnancy testing	Sexually active, time of last menstrual period.

Choice Of Anesthesia

- There are four main types of anesthesia from which to choose:
- General anesthesia
  Provides loss of consciousness and loss of sensation.
- Regional anesthesia
  Involves the injection of a local anesthetic to provide numbness, loss of pain or loss of sensation to a large region of the body. Regional anesthetic techniques include spinal blocks, epidural blocks and arm and leg blocks. Medications can be given that will make the pt comfortable.

- Monitored anesthesia (MAC)
  Consists of medications to make you drowsy and to relieve pain. These medications supplement local anesthetic injections, which are often given by your surgeon. While you are sedated, your anesthesiologist will monitor your vital body functions.
- Local anesthesia
  Numbness to a small area, is often injected by your surgeon. In this case, there may be no anesthesia team member with the patient.

ASA Classification

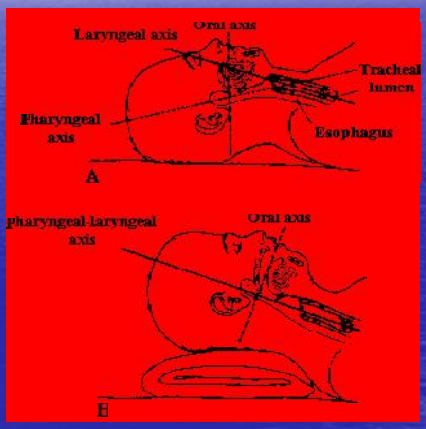
- The American Society of Anesthesiologists'(ASA) physical status classification serves as a guide, to allow communication among anesthesiologists about clinical conditions of patients. A way to predict their anesthetic/surgical risks -the higher ASA class, the higher the risks.
- ASA Classification
- Class 1Healthy patient, no medical problems
- Class 2 Mild systemic disease
- Class 3Severe systemic disease, but not incapacitating

- Class 4 Severe systemic disease that is a constant threat to life.
- Class 5 Moribund, not expected to live 24 hours irrespective of operation.
- An E is added to the status number to designate an emergency operation.
- An organ donor is usually designated as Class 6.

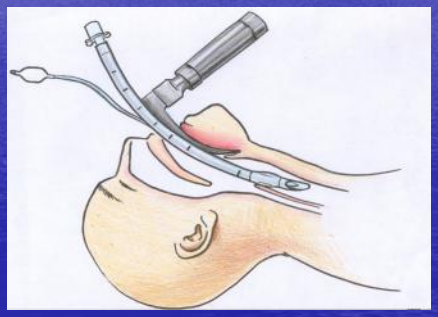
Intraoperative management

- Equipment Check
  - Suction
  - Airway
  - Laryngoscope
  - Tube
- Apply Standard ASA Monitors - Pulse ox, EKG, NIBP, precordial or esophageal stethoscope
- Put pt in optimal intubating position.

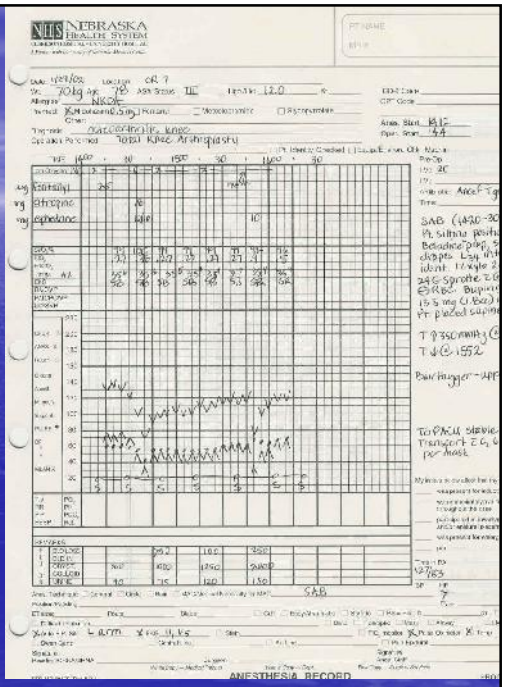
- Preoxygenate
- Induction - IV anesthetic (propofol), Narcotics, Muscle relaxant
- Mask ventilate



- Intubate
- Check breath sounds, end tidal CO_2, Blood pressure, HR, sats.
- Maintain on Inhalation agent.
- Patient positioning - protect pressure areas



- Intraop fluid management
- Anesthesia record
- Vital signs monitoring



- Indications for intubation:
- · Uncorrectable hypoxemia (pO2 < 55 on 100% O2 NRB).
- · Hypercapnia (pCO2 > 55) with acidosis (pH<7.25); remember patients with COPD often live with a pCO2 50-70+ without acidosis.
- · Ineffective respiration (max inspiratory force < 25 cm H2O).
- · Fatigue (tachypnea with increasing pCO2).
- · Airway protection.
- · Upper airway obstruction.
- · Septic shock.

- Extubation criteria:
- pt responsive to simple commands
- Good muscle strength - hand grip, 5 sec head lift
- Hemodynamically stable
- Others: no inotropic support
- pt afebrile
- vital capacity ≥ 15cc/kg
- ABG reasonable with FiO_2 40% (PaO2 ≥ 70, PaCO2 < 55)

Postoperative management

- PACU Guidelines

- STANDARD I
  ALL PATIENTS WHO HAVE RECEIVED GENERAL ANESTHESIA, REGIONAL ANESTHESIA OR MONITORED ANESTHESIA CARE SHALL RECEIVE APPROPRIATE POSTANESTHESIA MANAGEMENT.

- STANDARD II
  A PATIENT TRANSPORTED TO THE PACU SHALL BE ACCOMPANIED BY A MEMBER OF THE ANESTHESIA CARE TEAM WHO IS KNOWLEDGEABLE ABOUT THE PATIENT'S CONDITION. THE PATIENT SHALL BE CONTINUALLY EVALUATED AND TREATED DURING TRANSPORT WITH MONITORING AND SUPPORT APPROPRIATE TO THE PATIENT'S CONDITION.
- STANDARD III
  UPON ARRIVAL IN THE PACU, THE PATIENT SHALL BE RE-EVALUATED AND A VERBAL REPORT PROVIDED TO THE RESPONSIBLE PACU NURSE BY THE MEMBER OF THE ANESTHESIA CARE TEAM WHO ACCOMPANIES THE PATIENT

- STANDARD IV
  THE PATIENT'S CONDITION SHALL BE EVALUATED CONTINUALLY IN THE PACU.
- STANDARD V
  A PHYSICIAN IS RESPONSIBLE FOR THE DISCHARGE OF THE PATIENT FROM THE POSTANESTHESIA CARE UNIT.

Discharge Criteria

- Post anesthetic discharge scoring (PADS) system is a simple cumulative index that measures the patient's home readiness.
- Five major criteria: (1) vital signs, including blood pressure, heart rate, respiratory rate, and temperature; (2) ambulation and mental status; (3) pain and PONV; (4) surgical bleeding; and (5) fluid intake/output.
- Patients who achieve a score of 9 or greater and have an adult escort are considered fit for discharge (or home ready).

- Vital Signs: 2 = Within 20% of the preoperative value, 1 = 20%–40% of the preoperative value, 0 = 40% of the preoperative value
- Ambulation: 2 = Steady gait/no dizziness 1 = With assistance 0 = No ambulation/dizziness
- Nausea and Vomiting: 2 = Minimal 1 = Moderate 0 = Severe
- Pain: 2 = Minimal 1 = Moderate 0 = Severe
- Surgical Bleeding: 2 = Minimal 1 = Moderate 0 = Severe